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Animal Care Forum



September 2015, Volume 42, No. 9

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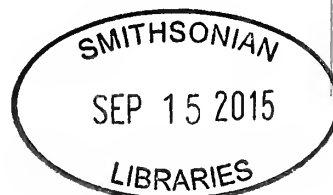
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MISSION STATEMENT

American Association of Zoo Keepers, Inc.

The American Association of Zoo Keepers, Inc. exists to advance excellence in the animal keeping profession, foster effective communication beneficial to animal care, support deserving conservation projects, and promote the preservation of our natural resources and animal life.

About the Cover

This month's cover comes to us from Camille Kruse of the Black Pine Animal Sanctuary and features "Fiero", a red fox (*Vulpes vulpes*). His color is classified as "silver" on the color phase charts that categorize the artificially selected red foxes that are bred and raised for the fur and pet trades. This middle-aged fox was recovered by an officer with the Indiana Department of Natural Resources after being reported as abandoned or escaped in a residential neighborhood. Residents concerned for the animal's safety, and the safety of their own pets, were responsible for reaching out to see that the animal was safely re-homed to Black Pine Animal Sanctuary in Albion, IN. Fiero and three other displaced former pet foxes are residing for "the REST of their lives" at Black Pine.

Red foxes live around the world in diverse habitats and their resourcefulness has earned them a reputation for intelligence and cunning. They are solitary hunters that feed on rodents, rabbits, birds, and other small game but their diet can be flexible and also includes fruit and vegetables, fish, frogs, and even worms. If living among humans, foxes will opportunistically dine on garbage and pet food.

Articles sent to *Animal Keepers' Forum* will be reviewed by the editorial staff for publication. Articles of a research or technical nature will be submitted to one or more of the zoo professionals who serve as referees for **AKF**. No commitment is made to the author, but an effort will be made to publish articles as soon as possible. Lengthy articles may be separated into monthly installments at the discretion of the Editor. The Editor reserves the right to edit material without consultation unless approval is requested in writing by the author. Materials submitted will not be returned unless accompanied by a stamped, self-addressed, appropriately-sized envelope. Telephone, fax or e-mail contributions of late-breaking news or last-minute insertions are accepted as space allows. Phone (330) 483-1104; FAX (330) 483-1444; e-mail is shane.good@aazk.org. If you have questions about submission guidelines, please contact the Editor. Submission guidelines are also found at: aazk.org/akf-submission-guidelines/.

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ANIMAL KEEPERS' FORUM

TO CONTACT THE AKF EDITOR:

Shane Good, Media Production Editor
P.O. Box 535, Valley City, OH 44280
330-483-1104
shane.good@aazk.org

AAZK Administrative Office

American Association of Zoo Keepers
8476 E. Speedway Blvd.
Suite 204
Tucson, AZ 85710-1728
520-298-9688 (Phone/Fax)
E-mail: Ed.Hansen@aazk.org
Chief Executive/Financial Officer: Ed Hansen

EDITOR

Shane Good

GRAPHIC DESIGNER

Elizabeth Thibodeaux

ENRICHMENT OPTIONS COLUMN COORDINATORS

Julie Hartell-DeNardo, Saint Louis Zoo

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NATIONAL ZOO KEEPER WEEK, PROGRAM MANAGER

Robin Sutker, Baltimore Zoo



*“To progress is
always to begin always
to begin again”*

— Martin Luther

After eight years as a member of AAZK’s Board of Directors and four years as National President, I have learned a great many things. One such lesson is this: Project management is not a linear process. And while the process of generating projects is a fairly standard one; sometimes out of necessity and other times based on a vision, the actual journey is much akin to the game of chess. The comparison is a simple one: one move is based on advancing towards the final goal with each move a calculation of an opposing move. The more experienced the player, the better one is at anticipating opposing moves. With project management, unexpected setbacks can be like an unexpected chess move and can create a period of strategic readjustment.

We encountered one such setback this past year. Last year, AAZK set out to modernize the way that we communicate, network, and learn through the development of AAZK Online in partnership with San Diego Zoo Global Academy and Cypherworx. We envisioned a portal through which our membership could network and learn through dedicated discussion groups and learning modules. Discussion groups were created, Learning Modules uploaded and selected working groups were granted gratis subscriptions. These groups included Board Members, Committees, Chapter Officers, and Conference attendees. Over 90 discussion groups were created, including dedicated groups for conference workshops. Although labor intensive, it provided us with the potential of taking AAZK into a new level, moving us closer towards our vision of being the leader in the zoo and aquarium industry fostering professional development and personal connections that advance animal care, animal welfare and conservation.

Those of you who were part of the inaugural working groups in AAZK Online saw the perfect plan hit a speed bump when certain elements of the format ceased to function, rendering much of our plan extremely limited. Without going into great detail, the fix was not an easy one and required that the whole format be recreated from scratch. Our partners in this venture have fixed most of the issues and I am happy to report that by the time you read this, AAZK Online will be working close to its full potential with the following features:

- ▶ Dedicated discussion groups
- ▶ Dedicated event planning and calendars for Chapters and Committees
- ▶ Resource management (AAZK, BFR, and Chapter resources)
- ▶ Dedicated Conference Workshop Discussions and resources
- ▶ Learning Module Access (both AAZK and the free San Diego Zoo Global Academy modules)
- ▶ Testing opportunities and tracking capabilities

After much discussion with our partners about the value of this program, we are happy to report that the site is up and running (although we still have much to develop in order to make it fully functional). Part of that development includes a repopulation plan. And now for the good news...because we believe so strongly in the direction of distance learning formats and centralized networking, AAZK will be providing a gratis subscription for all **Professional Members**. It may take us a full month to get everyone pushed into the system and definitely more time to work out individual learning curves, but we hope to have it up and running by the time we reach the Conference in St. Louis. Professional members can expect to receive log in instructions from Cypherworx shortly. Once in the system, the opportunities to learn and share will be plentiful.

The pathway from design to achievement is never a straight path. It's one that requires adjustments and readjustments. Most importantly, maintaining focus on the original goal helps to channel solutions in a forward direction without dwelling too much on the obstacles along the way.

As always, I welcome your thoughts and input. E-mail me at bob.cisneros@aazk.org ; I would love to hear from you. Drop me a line and I promise to write back.

Respectfully,

Bob Cisneros

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COMING EVENTS

Post upcoming events here!
e-mail shane.good@aazk.org

October 5-9, 2015

Giraffe Care Workshop

Colorado Springs, CO

Hosted by Cheyenne

Mountain Zoo

For more information visit:
cmzoo.org/index.php/giraffe-care-workshop/

October 11-15, 2015

Orangutan SSP Husbandry Workshop

Wichita, KS

Hosted by Sedgwick County Zoo

For more information visit:
scz.org/visitor_tickets-conferences.php

October 12-16, 2015

**Zoos and Aquariums
Committing to Conservation
Conference (ZACC)**

Denver, CO

Hosted by Denver Zoo

For more information go to:
<http://www.denverzoo.org/ZACC>

October 29-November 1, 2015

Advancing Bear Care - 2015

Hanoi, Vietnam

Hosted by Bear Care Group

For more information visit:
bearcaregroup.org/#!abc-2015--vietnam/c227f

November 6-8, 2015

**Southeast Regional
Gorilla Workshop**

Tampa, FL

Hosted by Busch Gardens

Tampa.
For more information contact:
keri.bauer@buschgardens.com

November 7-10, 2015

**Zoological Association of
America National Conference**

Las Vegas, NV

For more information go to:
zaa.org

November 18-22, 2015

**New World Primate TAG
Husbandry Workshop**

San Diego, CA

Hosted by San Diego Zoo

For more information go to:
<https://www.bpzoo.org/nwptag-conference-registration/>

March 19-24, 2016

AZA Mid-Year Conference

Omaha, NE

Hosted by Omaha's Henry
Doorly Zoo and Aquarium

For more information go to:
aza.org/midyearemeeting/

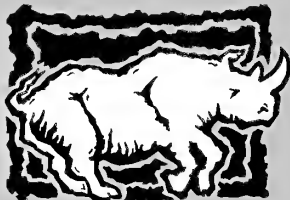
April 17-22, 2016

ABMA National Conference

Tampa, FL

Hosted by Lowry Park Zoo and
Busch Gardens Tampa

For more information go to:
theabma.org/abma-annual-conference/



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ASSOCIATION
of ZOO KEEPERS**

**September 27 - Oct. 1, 2015
AAZK National Conference**

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Hosted by Saint Louis Zoo and
St. Louis Chapter of AAZK

More details can be found
at: www.stlzoo.org/animals/soyouwanttobeazookeeper/americanassociationofzooke/

June 22-25, 2016

**International Herpetological
Symposium**

St. Louis, MO

Hosted by Saint Louis Zoo

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International Herpetological
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AAZK Announces New Communication Committee Chairperson - Rachael Rufino



I am very excited to be the new Chair of the Communication Committee! I am currently an Animal Keeper at the Smithsonian's National Zoo, with over 16 years of experience working with wildlife. I am also a member of AAZK's Professional Development Committee and former President of the Bay Area AAZK Chapter. I earned my B.A. in Environmental Sustainability and Social Justice from San Francisco State University. I love traveling, eating and of course, social media! I can't wait to meet all of you at the conference in Saint Louis.

Communication Committee Seeking Volunteer for Social Media Team

The Communication Committee is seeking a new volunteer member to join its Social Media Team! This team is responsible for relaying pertinent information between the Board of Directors, committees, membership, partner organizations and general inquiries from the public.

Duties include:

- ▶ Overseeing six AAZK Facebook pages and Twitter account
- ▶ Creating and posting daily social content for the main AAZK Facebook page
- ▶ Disseminating post information to appropriate page administrators with follow-up
- ▶ Creating and disseminating social media goals to appropriate committees by organizing and facilitating GoToMeetings
- ▶ Ensuring that all AAZK social media activity abides by the Social Media Directive
- ▶ Other duties as needed



The ideal candidate has excellent communication skills and experience managing social media for an organization. We are looking for a creative individual interested in expanding AAZK's web presence through engaging social content to increase followers, membership, merchandise sales and promote events. Please plan to commit 8-10 hours per week in this position. Must be a member of AAZK. Please send your cover letter and resume to: bethany.bingham@azk.org

AAZK Announces New BHC Co-Chairperson - Amanda Ista



Amanda Ista of Milwaukee County Zoo will join Blank Park Zoo's Megan Wright as Co-Chair of the Behavioral Husbandry Committee. The Behavioral Husbandry Committee exists to serve our AAZK members by providing access to up-to-date resources relevant to Behavioral Husbandry topics including: training, enrichment and animal welfare. The committee strives to encourage, educate, share knowledge and share techniques typified in zoo and aquarium settings. Amanda also contributes to AAZK and the *Animal Keepers' Forum* as one of the Column Coordinators for Conservation Station.



Let's Be Friends

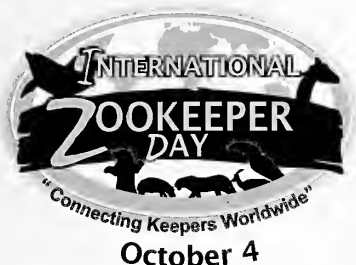


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INTERNATIONAL ZOOKEEPER DAY, OCTOBER 4.



The International Congress of Zookeepers hereby declares October 4, 2015, to be the inaugural "International Zookeeper Day", or IZD.

This declaration comes at a time when many animal species are in great peril across the globe. Many species are facing extinction, and their ecosystems and habitats are under tremendous pressure from diverse forces, both natural and man-made.

This special day will be observed annually on October 4, in recognition of the valuable contribution zookeepers make to the care and conservation of exotic animals.

Stewardship is the last hope for many endangered species. The professionals who devote their lives to saving species by way of conservation and breeding programs, education outreach, and research, work tirelessly to save these animals.

This celebration shall include all who make it their life's work to care for animals, whether they are involved with zoos, sanctuaries, aquariums, rescue centers, parks or reserves. All who work to improve and save the lives of animals shall be commemorated on this day.

Each October 4, the ICZ, via International Zookeeper Day, will engage in programs, activities, and ceremonies which encourage education and public awareness of the important role of keepers in wildlife conservation.

THE INTERNATIONAL CONGRESS OF ZOOKEEPERS (ICZ)

From its inception, the ICZ has had one goal - to improve the professionalism of zookeepers worldwide, which in turn will improve animal welfare in zoos throughout the world.

THE VISION OF THE ICZ

A global network of zookeepers with the highest standards of professional animal care contributing to a diverse and sustainable natural world where neither wild animals nor their habitats are in danger.

THE MISSION OF THE ICZ

The ICZ will build a worldwide network among zookeepers and other professionals in the field of wildlife care and conservation. This exchange of experience and knowledge will improve the professionalism of zookeepers for the benefit of the animals under their care and promote awareness and actions that will contribute to the preservation of wildlife everywhere.

WHY OCTOBER 4?

This date is celebrated worldwide as the Feast of Saint Francis of Assisi. He is known as the patron saint of animals and the environment, and, since 1979, the Patron Saint of Ecology. He preached that it is the duty of men to protect and enjoy nature. Many of the stories that surround the life of St. Francis say that he had a great love for animals and the environment.

HELP CELEBRATE IZD! START PLANNING YOUR EVENTS NOW!

Norah Farnham, ICZ Coordinator



Photo Courtesy of Wildlife Survival Sanctuary

Our task must
be to free
ourselves...by
widening our
circle of
compassion to
embrace all
living
creatures and
the whole of
nature and its
beauty.

Albert Einstein

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Weighing the Options: New Technologies Advance Wellness and Weight Management for Animals at the Buffalo Zoo

Will Smith, Director, Marketing & Business Development, SR Instruments

Like all zoo managers and keepers, the staff at the Buffalo Zoo in western New York continuously looks for ways to ensure the best care possible for the animals they manage. This includes everything from new habitat designs, improvements to existing compounds, medical care, and daily management programs.

Critical to the health of their animals is ensuring a complete wellness program that focuses on nutrition, exercise and on-going health maintenance by their animal keepers. One area where the Buffalo Zoo staff has utilized new technology is in the area of animal weight management. Finding the right tools and discovering new options for gathering animal weight data can be challenging. Over the years, keepers at the zoo have worked with a leading medical scale manufacturer to develop a number of niche-application weighing solutions that have been tailor-made for specific exhibits at zoos.

For instance, a regional aquarium learned that the manufacturing company had adapted its medical scales for veterinarian applications. The aquarium inquired if the company could design a scale for its dolphins as the dolphins were creating injuries to staff members when being weighed. The design engineers at the company worked with the dolphin trainers to create a waterproof, slide-on platform scale. Using this new scale design, the dolphins are now rewarded to slide on to the scale from their pools to be weighed. This same large platform scale was put in place at the Buffalo Zoo for its sea lions.

Other animal scales were soon developed for zoos that enabled keepers to gather more accurate weight data on their animals. However, several large animals at the Buffalo Zoo were in need of an updated weighing system, most notably the elephants and rhinos.

*Photo by Kelly Ann Brown,
Buffalo Zoo Registrar*




Working with the design team at the scale company, a new portable platform scale was developed to meet the needs for these large mammals. Some of the many considerations that needed to be included in the scale design was the ability to accurately obtain weight data no matter where the animal stood on the platform, as well as eliminate wires that could be chewed or stepped on causing harm to the animals and damage to the scale. To help address these and other technical design challenges, the scale incorporates a wireless app that is synchronized to the platform's electronics. The rugged and low-profile waterproof enclosure made it easy and comfortable for animals to be quickly trained to walk or stand on the scale.

"It's really important for us to be able to closely monitor the weight of these magnificent animals," commented Mindy Ussrey, elephant manager at the Buffalo Zoo. "The new scale shows us how much the elephants need to eat or not eat at any given time. Our elephants are on a strict diet and in fact, one is on medication, so managing the animal's weight is even more critical."

Ussrey notes that like people, elephants too, will experience health issues if proper weight is not maintained. "So if an elephant becomes overweight it can have the same impact on their joints, muscles, and heart as it does for a person. This also contributes to the need for our elephants to be accurately weighed on a regular basis. What we look for when we weigh them are big drops in weight loss or spikes in weight gain. For instance, a couple hundred pound drop is not significant, but something in the neighborhood of a thousand pounds, we need to look more closely at their nutrition. Before our new wireless scale we used a body score system, a photo and illustration numbering system which was not accurate."

Since the scale is portable in design, it enables the staff to rotate the scale from the elephants to the rhino compound to gather these weights as well, including the new baby rhino. At six months of age, the baby rhino is already over a thousand pounds.

Joe Hauser, head rhino keeper notes that for his rare Indian rhinos, maintaining their weight is an on-going process. Having successfully bred three Indian rhino calves, weight monitoring is a critical factor for these animals as well. "We want to make sure the calf is steadily gaining weight. By routinely weighing our rhinos and especially the younger ones, we have an accurate record of the animal's weight. For example, if a calf would ever plateau or decrease with weight, we would be able to more quickly identify potential problems and determine a corrective approach."

Buffalo Zoo's General Curator Malia Somerville shared that the recently opened Arctic Edge Exhibit incorporates two built-in SR Scales' weighing platforms to assist keepers and veterinarian staff to more accurately manage the weight of the zoo's polar bears. "Having these new scales in place is part of our initiative to provide state-of-the-art facilities and equipment that not only gives our animals the best care possible, but also equips our staff to have the latest tools that give them added confidence and knowledge to care for our wonderful animals." 

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Building CONFIDENCE in a Fearful Rhino

*Teresa Deaton, Keeper I
Nichole Bouwens, Former Senior Keeper
Zoo Atlanta
Atlanta, Georgia*



In April 2011, Zoo Atlanta acquired Utenzi, a seven-year-old male Eastern Black Rhinoceros (*Diceros bicornis michaeli*) with the objective of adding a breeding male to the collection. Utenzi had a history of being consistently nervous and flighty if he was exposed to anything unfamiliar. His anxiousness subsequently led to stereotypic horn rubbing. As a result, Utenzi had worn two large, vertical grooves behind his primary horn.

When Utenzi arrived at Zoo Atlanta, it was expected that transitioning him into a new environment and routine would be challenging, and could potentially exacerbate the horn rubbing. However, while in quarantine, Utenzi seemed to adjust well to his new indoor holding area. He shifted easily between stalls and quickly became accustomed to the daily cleaning routine and the noise of the hydraulic doors. The horn rubbing continued, but became less severe.

Throughout Utenzi's quarantine period, enrichment items (both hanging and objects placed on the ground) were offered with hopes of lessening the horn rubbing. Unfortunately, the introduction of enrichment had an adverse effect, and it quickly became apparent that the enrichment items were causing a fear response. Because of this negative reaction, the keepers felt it was in Utenzi's best interest to offer enrichment when he was out of quarantine and in a more consistent routine.

Towards the end of Utenzi's quarantine, his horn rubbing and gouging increased. Not only were the grooves in his primary horn worsening, he also began vigorously rubbing the base of the primary horn in a horizontal motion, creating a deep groove. Veterinary staff became increasingly concerned that he could possibly damage the horn growth plate.

When Utenzi's quarantine period expired, he was housed in the same barn as the female rhino, Andazi. This allowed both rhinos to have visual contact with one another. It appeared that Andazi's presence reduced Utenzi's anxiety and over time, he was introduced to the outdoor corral and exhibit. He was cautious at first but quickly adjusted to his daily routine. Initially these changes seemed to create a distraction, and again, the horn rubbing decreased.

The damaged areas to the primary horn, including the horizontal gouge at the base, began to grow out. Although this was a huge accomplishment, Utenzi continued to react negatively to anything unfamiliar including browse, enrichment objects and the presence of more than one keeper in the area. These reactions included fleeing and refusing to return, or backing into a corner staring wide-eyed and unmoving. The only enrichment items that could be offered without causing a fear response were scents, nature sounds, or soft music.

Working with an animal as nervous and flighty as Utenzi was extremely challenging for the keepers. Any insignificant change in routine would cause such an adverse reaction that, in addition to the horn rubbing, he eventually began refusing to shift. It quickly became the keeper's mission to strategize a plan that would allow the introduction of new sights, sounds, people and objects in a non-threatening manner. The goal was to desensitize Utenzi to changes in his environment so that he could learn to cope instead of react in such an extreme and negative manner. Although it seemed like a simple task at the time, it became clear that a lot of patience, combined with a flexible strategy was essential to the keeper's and Utenzi's success.

To help Utenzi adjust and cope with change, a combination of training and enrichment strategies were discussed. The first priority was to get Utenzi comfortable in the presence of multiple people. Although he trained readily for one person, he usually refused to participate with two or more people present. So, the first task was to have two keepers randomly visit Utenzi and free-feed him some of his favorite treats. Over time he relaxed enough to be rubbed down and he even tolerated an occasional bath. As Utenzi began to show progress, the keepers invited unfamiliar people to join the training sessions. Eventually, the keepers were able to provide behind-the-scenes tours for special guests, which included hand feeding Utenzi. It took a few months to work up to this, but patience and small progressive steps were key.

Although great strides were made with training, it remained a struggle to offer Utenzi object enrichment. Any type of enrichment objects or large browse would elicit a fear response. When browse was offered, Utenzi would only tolerate small pieces on the floor. The keepers soon decided to introduce items at a distance, either outside of his enclosure, or in an area that provided a visual barrier for Utenzi if needed.

Zoo Atlanta's rhinos are housed separately where one rhino is on exhibit, and the other remains off exhibit in a holding area with access



Photo 1 by Nichole Bouwens



Photo 2 by Nichole Bouwens

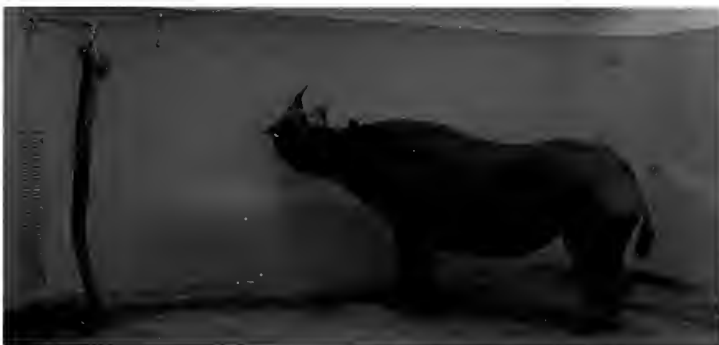


Photo 3 by Nichole Bouwens

"It quickly became the keeper's mission to strategize a plan that would allow the introduction of new sights, sounds, people and objects in a non-threatening manner."

to an outdoor corral and an indoor stall. The keepers decided to slowly introduce enrichment items on the days Utenzi was off exhibit so that his response could be monitored. After morning cleaning was complete, an enrichment object was placed either on the floor outside of his stall or on the floor in the far corner of the stall. He would typically stare at the object from a distance, and then run into the corral. Eventually, Utenzi would return and the cycle would start over again. When an object was in the stall, treats were placed nearby to entice him to get closer.

The first major breakthrough was a 55-gallon drum that contained a small amount of grain inside. Once Utenzi approached the barrel and realized there was food inside, he attacked it! He pushed the drum all over the stall and corral, slamming it into walls, lifting it up and dropping it over and over again. When the grain fell out, he didn't even notice. Utenzi played with the drum for about 30 minutes without ever eating a single piece of grain. After the success with the drum, the keepers began to introduce other objects on the ground such as large, hard plastic balls and kegs. Though these were accepted and played with, none were as well received as the drum, which today, still remains Utenzi's favorite enrichment item.

There are many enrichment items earmarked for the rhinos, but many are only approved because they can be hung on a pulley in the stall. These items were not an option for Utenzi because of his fear of suspended objects. Although he was receiving some enrichment at this point, the keepers wanted to provide him with more of a variety. Utenzi's keepers were aware that desensitizing him to hanging enrichment would be a very slow process that would require a flexible strategy, a lot of observation and patience. To start off, one item at a time was hung in the keeper area or in the adjacent stall so that Utenzi could view the object without feeling threatened. Each day, the enrichment items were replaced with a new object in varied locations. Eventually, Utenzi began to tolerate the items hanging closer and closer to his stall until finally, he allowed items to be hung right outside of his stall (Photo 1). This gave Utenzi an opportunity to investigate and touch the object, but he was also free to leave the area if he felt threatened. Once he was comfortable with an item on the outside of the stall, the items were then moved to the corner inside his stall (Photo 2).

Photo 4 by Nichole Bouwens



Photo 5 by Teresa Deaton

Surprisingly, the transition from hanging items on the outside of the bars to the inside went very smoothly. Initially the objects were hung in a corner, but moving the items further into the stall took quite a bit more time and desensitization. When objects were hung about 2-3 feet away from the corner, he regressed for a day or two, but he eventually began curiously approaching and touching the items. After a few days of rotating through various items hanging in that spot, the items were moved even further in and the rotation schedule was repeated. His favorite treats were placed under the hanging items at each new location to entice him to come inside and explore. Our final spot was the cable. Again, he regressed and he stayed outside completely ignoring the stall and the treats for a few hours, but by the end of the day, he was in the stall sharing space with the object hanging from the cable (Photo 3). Eventually, all of the hanging enrichment items were rotated through. He now interacts appropriately with a variety of enrichment items, regardless of their location (Photos 4 & 5).

Utenzi has made enormous progress in the relatively short time he has been at Zoo Atlanta. Remaining patient and consistent, and recording his behavioral responses toward enrichment objects played a major role in Utenzi's success. Desensitizing him to various enrichment items has helped him adjust easily to various changes in his environment including new exhibit furniture, large browse piles, equipment in the keeper area, etc. Utenzi's keepers are also regularly hanging limbs and branches for him to browse on and his stereotypic horn rubbing has significantly decreased.

Today, Utenzi no longer exhibits a nervous, rigid posture. He stands tall, appears relaxed and is more interactive with his environment. He easily adjusts to new people, and is now unaffected by the presence of more than one person in the area. He even utilizes more exhibit space, regardless of crowds and noise levels. Quite often guests can observe Utenzi taking an afternoon nap directly under an elevated viewing platform with people standing right above him! 🐘

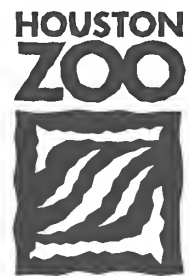


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Hooked on Body Condition Scores and Pinning Down Animal Fitness:

A Novice Guide to How to Evaluate Your Hoofstocks' Health

Jason Doll

Pre-Veterinary Student
Delaware Valley College
Doylestown, PA



“There are bugs on her dugs.
There are flies in her eyes.
There’s a lump on her rump big
enough to be a hump!
.....We’ve no time to sit and dither
while her withers wither with her.”

(Sondheim, 1986)

Introduction

In the Stephen Sondheim acclaimed musical (and 2014 film) *Into the Woods*, Jack’s wishful mother laments of the health status of the family’s cow, Milky White. The animal is not giving milk, quite old, and (by the sound of the lyrics) is not in the best health. While a lot of Milky White’s problems seem to be ectoparasites and possible seroma, it appears that the cow also has had a great loss of subcutaneous fat (SQ fat). Weight management is extremely important when monitoring an animal’s health. Usually a ten percent change in weight (up or down) could lead to serious complications in the animal’s overall health and may even lead to death. Although Jack’s Mother is not a keeper *per se*, she does have a basic understanding of animal anatomy and behavior by means of creating a “scale” to evaluate Milky White’s fitness. This scale is known as a Body Condition Score (BCS) and is used by anyone that monitors the health status of animals, from small animal veterinarians to dairy managers to keepers to Grimms’ fairytale characters.

What is a BCS?

A BCS is very important for anyone that wants to care for animals. It is a scale (usually 1-5 or 1-9) where lower numbers indicate thinner animals and higher numbers indicate fatter animals. The best BCS is usually in the middle of the scale, but if an animal is growing, pregnant, or preparing for hibernation, the BCS can be slightly skewed. However, a BCS is a great quantitative, as well as qualitative, tool for keepers and veterinary staff because the numbers are based upon a BCS table that can be taxa specific, but are all based upon a few anatomic factors.

Basic Anatomy to Build a BCS Foundation

The majority of hoofstock can be evaluated via a few anatomy landmarks, specifically in the hip region (Reece, 2006). These include:

- ▶ Tuber coxae aka “hooks”: projections of the ilium (more dorsal)

- ▶ Tuber ischia aka “pins”: projections of the ischium (more ventral)
- ▶ Thurl line: the invisible line that connects the “hooks” to the “pins” superficially

If the projections are more prominent, this means that there is less subcutaneous fat, and therefore the animal has a lower BCS. Moreover, if the thurl line is more angular (V-shaped), then that means the BCS is lower. Likewise, if the thurl line is more rounded (U-shaped), this means the BCS is higher because there is more subcutaneous fat (SQ fat) than the animal with the more angular thurl-line.

Visibility of ribs can also be used to determine a component of the BCS. Both the number of ribs, as well as the depth of ribs, can be used to evaluate an animal. However, rib recognition is not always as reliable because the majority of hoofstock species are ruminants and their digestive systems fill with gas, which can appear to give an expansive look to the body cavities, even though those organs are not housed there.

Other Anatomical Components to BCS

- ▶ Coat:

The coat (meaning the skin and hair) of the hoofstock is one of the best clues of not only the quantity of SQ fat, but also of the quality of the coat itself. Lack of hair is a sign of distress and lower fitness, whereas a thick, glossy coat signifies health due to the secretion of sebum from the sebaceous glands (Reece, 2006). A coat that is not healthy will be sparse and dry. Noting the patterns on an animal’s coat is also an important feature of determining a consistent way to gauge fitness. Zebra stripe fluidity is an excellent tool to determine this equid’s BCS. The more SQ fat there is, the more fluid the stripes will be, and thus a higher BCS. The less SQ fat there is, the more the stripes will hug the bones and give the stripes a very angular look, thus giving a lower BCS.

- ▶ Neck girth:

Hoofstock with larger necks, such as giraffids and gerenuks, are excellent models of using the girth of the neck to determine the BCS since SQ can thicken the neck. This can be used simply by vision or palpation, but also by measurement. However, if measurements are being used, the same place of the neck should always be used to ensure consistent measurements.

Taxa Specific Notes

- ▶ Odd-toed ungulates:

Depressions (fossae) are normally quite common in odd-toed ungulates (equids, rhinoceroses, tapirs) and can be great landmarks for getting an idea of SQ fat quantity. Two common fossae, especially in rhinoceroses are the spinatal fossa, which is located on the shoulder-blade, superficial to the supra/infraspinatus muscles (O’Reuter and Adock, 1998). The second is located cranially and sound like it belongs in a science-fiction novel rather than an anatomy book; Viborg’s Triangle. This triangle is a popular site in equine surgery and its borders include the caudal border of the mandible, the lingual facial vein, and the sternocephalicus tendon (Cornell, 2004). Since there is not a lot of muscle in this area, there is a great potential for fat accumulation.

- ▶ Heftier Hoofstock:

For hoofstock that are not as dainty, such as hippopotami, a keeper cannot simply formulate a BCS by the mere presence of fat, but by the amount of fat presence. Therefore comparison of other animals is usually the most helpful so that the keeper has something to compare the distribution of fat. However, there is a certain area where hippopotami only put on fat when their BCS is very high. This area is at the base of the tail, located in the sacrococcygeal region.

Example

Below is an example for *in situ* Cape buffalo (*Syncerus caffer*), which is why the score only goes from 1.0 - 3.0 with 0.5 increments since there are usually not overweight or obese animals in the wild.



Cape buffalo in Sabi Sands Game Reserve, Umkumbe, South Africa
(photo by Rebecca Tritt)

The individual was given a score of 1.0. The coat is very dull and balding in several areas. The ribs are visible with very deep depressions and there is a very deep fossa located ventral to the neck. The left "hook" (tuber coxa) is very obvious and prominent, making the flanks protrude beyond the hip point.



Cape buffalo in Sabi Sands Game Reserve, Umkumbe, South Africa
(photo by Rebecca Tritt)

The individual (the one in the water) was given a score of 2.5. The coat is slightly balding but overall has a relatively healthy coat. Only a couple ribs are visible, but are very shallow. There is a slight roundness to the body, but not enough to declare this animal as a 3.0 because of the visible ribs and slight baldness.



Cape buffalo in Sabi Sands Game Reserve, Umkumbe, South Africa
(photo by Rebecca Tritt)

The cow was given a score of 2.0. The coat is dull and balding in a number of areas, specifically in the hindquarters. A few ribs are visible, but with very shallow depressions. There is a slight depression ventral to the neck. The flanks are relatively flat.

The calf was given a score of 3.0. The coat is glossy and thick. The hips have a natural protrusion and there is a small amount of fat lying at the base of the tail.

Body Condition Score	Criteria (purely visual)			
	Hips	Coat	Ribs	Thurl line
1.0 (emaciated)	Protrude beyond hip point	Dull coat <75% of body patchy or balding	Visible with deep depressions	V-shaped
1.5 (very thin)	Protrude slightly beyond hip point	<50% of body patchy or balding	Visible with slight depressions	Very angular
2.0 (thin)	Flanks are concave	Thin coat, several patches or balding areas	Majority of ribs slightly visible	Angular
2.5 (lean)	Flanks are flat	Mostly glossy coat, a couple patches or balding areas	Central and caudal ribs slightly visible	Slightly rounded
3.0 (ideal)	Natural hip protrusion	Glossy and thick coat, no patchy or balding areas	Only most cranial ribs slightly visible	Almost semi-lunar in shape

Tips


- ▶ Take the BCS around the same time (midday, after feeding, etc.) to ensure consistent results
- ▶ Have multiple people on the hoofstock team (interns to full-time keepers) to try to get an average and ensure there are no biased scores
- ▶ Make silhouettes of the animals using a marker and a piece of plastic projection screening. This will require for the animal to always be in the same body position and distance away, but will help make a very nice way to monitor if there is any rapid change in weight.
- ▶ If palpation or measurements are possible, add them as components to the scoring scale
- ▶ Try not to take a BCS of a pregnant or growing animal, but still monitor their weight

Conclusion

A BCS is extremely important as it is one of the ways to gauge the fitness of a captive animal. However, the basis of the scale is basic animal anatomy as well as incorporating taxa specific components, such as stripe fluidity for the zebra and neck girth for the giraffe. So the next time you see *Into the Woods*, look at Milky White. Does she live up to the description that Jack's Mother gives her? What do you think her BCS is?

(Note: sometimes this character is made of papier-mâché, which has a whole separate scoring scale)

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Lights Out Baltimore

Lindsay Jacks
National Aquarium, Baltimore, MD
501 East Pratt Street (Aquarium)
Baltimore, MD 21202
LJacks@aqua.org

Kill lights. Save birds. This is the goal of Lights Out Baltimore, a non-profit striving to make Baltimore safe for migratory birds. Birds migrate by navigation of the moon and stars. The birds become disoriented when flying over brightly lit cities causing them to enter the urban environment. Once in the city area, buildings made with clear and reflective glass become a deadly trap. It is estimated that as many as one billion birds die from window collisions per year in North America.

On any day during fall or spring migration, you can see a couple of Lights Out Baltimore (LOB) volunteers scouring the downtown streets at 5:00 a.m. with nets in hand to save birds and collect the ones that did not survive their journey through "Charm" City. LOB monitors a five-mile route of 15-20 downtown buildings four months per year (April, May, September, and October). All of the dead birds are collected and placed in a sealed plastic bag. The bag is labeled with the date, species, location, weather, and light level of the location.

The birds will remain in a freezer until a final inventory and more data is collected: sex, age, and wing chord. The birds are then added to the

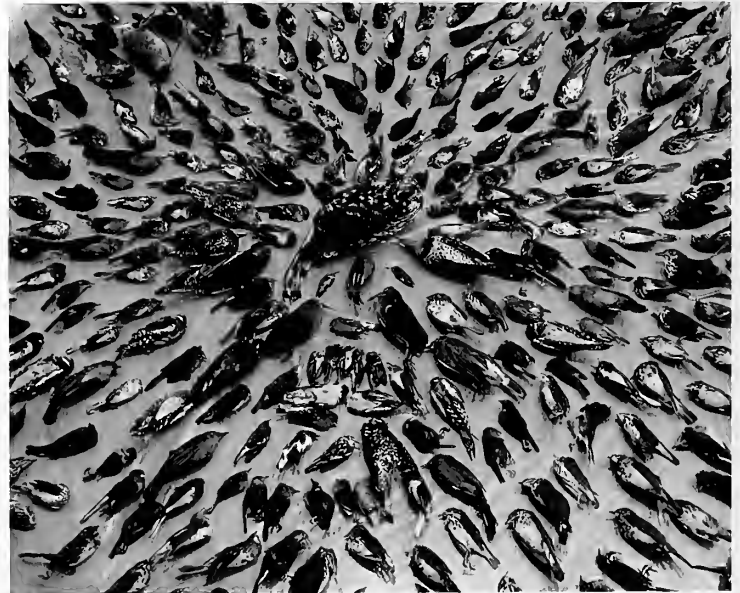
collection at Smithsonian's Natural History Museum for further research. Our data has been used by researchers recently to determine the 25 most vulnerable species to window collisions.

In the early hours, we aren't just collecting dead birds, we are also rescuing stunned birds from collisions or birds that can't navigate out of the glass maze. We net the injured birds (throwing a jacket works too when your net is left in your car), place them in brown paper bags so they don't injure themselves further during transport, and take them to a licensed wildlife rehabilitator at the end of the walk. In one day during peak migration, we have found 38 dead birds and rescued 10 birds. Our rehabber has a 95% success rate with the birds we rescue from our daily monitoring. The 5% die from severe head trauma or punctured lungs. As a bird keeper, I have long accepted the fact that a bird on its back, legs up, and feet curled means dead, but as the Director of LOB, I have learned it means run fast to wake the bird up from shock and place it in a bag.

LOB was founded in 2008 and has collected over 2400 dead birds



Scarlet Tanager found Spring 2014. Photo by Lynne Parks

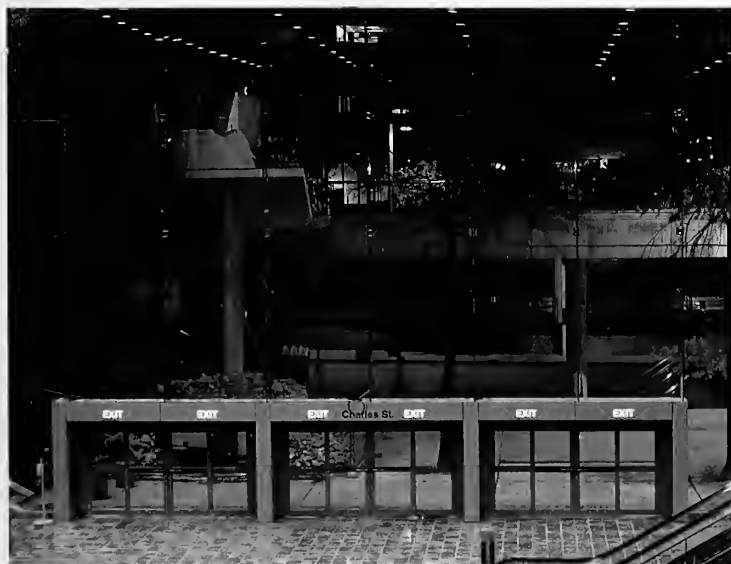


A portion of birds collected in 2014. Displayed at Artist Reception for "Unfriendly Skies: Birds, Buildings, and Collisions." Photos by Shayna Clevenger

and rescued over 500. We have found 57 species including American Woodcock, Virginia Rail, Mourning Warbler, Scarlet Tanager, Indigo Bunting, and more of the beautiful and rare migrants birders spend time photographing or documenting for eBird. In fall of 2014 we utilized our Facebook and Twitter pages to ask the Baltimore community to report window collisions and injured birds. With the help of this aggressive social media campaign, we found over 400 dead birds and were able to rescue over 100. This campaign meant we were on call 24/7 to rescue birds in the middle of the night and to answer calls from concerned citizens catching the birds while LOB arranged transport to the rehab center. We reached out to security guards of downtown businesses and armed them with nets, paper bags, and a number to call once they rescued a bird. With this new strategy, we documented more dead birds in this fall period than in the past six years and rescued three times the amount of birds than any other season.

LOB started with zero building participation, but thanks to good press and data, we now have five buildings in the city that turn decorative lighting off.

While the grunt work of LOB is migration walks, the daily and year-round goal is to encourage businesses to turn decorative lighting off during migration season from 11:00 p.m. - 6:00 a.m. and to advocate for legislation that will support efficient lighting fixtures and bird-friendly building standards. There are about 19 lights out programs across the nation including Washington D.C., Chicago, New York, Minneapolis, and Boston. Chicago has over 100 buildings that participate and New York has over 40 buildings that turns non-essential lighting off during migration season. The Empire State Building, Rockefeller Center, and the Chrysler Building are a few of the buildings in New York contributing to their lights out program. Bird-friendly building standards have been adopted in several locations including Oakland, San Francisco, Minnesota, and Toronto to mitigate bird collisions. The state of New York passed a monumental lighting bill in December 2014 effective January 1, 2016 that will reduce light pollution and ultimately save birds, energy, and money.



The Baltimore Convention Center with a clear view of nearby trees presents a confusing image for birds. Photo by Lynne Parks

To lead an organization like LOB, it is a daily exchange of e-mails and letter writing to city officials, business owners, and legislators to push for change. LOB started with zero building participation, but thanks to good press and data, we now have five buildings in the city that turn decorative lighting off. Maryland legislation has not made advances as of yet- a house bill has been proposed for four years running to require efficient lighting practices by state funded projects. This bill is yet to pass committee, though, LOB will continue to testify and work with delegates to make improvements.


Awareness is the first step in conservation. Dr. Daniel Klem, the world's leading expert on bird collisions, states, that, "you would need 333 Exxon Valdez oil spills each year to match the carnage," of the lowest estimate of 100 million window strikes. It is sad to say that oil spills garner press while everyday collisions are overlooked. LOB and other lights out programs are trying to do exactly that - bring their deaths into the light (no pun intended). This past spring, LOB gathered local and national artists to create an art show held at Goucher College's Silber Art Gallery titled "Unfriendly Skies: Birds, Buildings, and Collisions." The gallery highlighted works of art portraying the beauty of birds with the harsh reality of building collisions. The show has ended but will move to George Mason University this fall to collaborate with D.C. artists and leading experts. With the upcoming art show, lectures at nature centers, tweeted pictures of dead warblers, and letters to legislatures, we are working to kill lights and save birds. Our early morning wake-up call is for the birds. Literally.

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"Unfriendly Skies: Birds, Buildings, and Collisions" showcased at Goucher College's Silber Art Gallery (March-May 2015). Photo by Lindsay Jacks

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Not Every Trainer is a Keeper; But Every Keeper is a Trainer

Ellen Dreyer, Austral/Asia Keeper, Brevard Zoo, Melbourne, Florida

Many keepers, including me, often envy our colleagues with titles like Behavioral Husbandry Manager and Animal Trainer I, II or III. We imagine their days must consist of free-flying hawks and macaws, target training tigers and bears, and swimming with dolphins without ever touching a rake or shovel. Their hair probably doesn't stick to their sweat-free heads and their clothes are not stained the color of fresh fecal matter. Though I'm fairly certain that description is not entirely accurate (but if this job exists at your facility let me know if you have an opening!), I have learned to make the most of every minute I have for training. Lucky for me, every minute spent in an enclosure is time for training, so I have plenty of opportunities. Through speaking with behavioral husbandry managers and training consultants about their experiences working with keepers, I have begun to realize there is a common misconception among many keepers. We often recite the same mantras: "There's not enough time for training". "Training plans have to be written, then approved by managers, and then carefully supervised and it takes too long". "I don't know how to train my animals" or "I don't want to train my animals". "Why does it matter as long as the husbandry gets done?"

Keeper Ellen Dreyer conducting a brief training session with 0.5 variable flying fox (*Pteropus hypomelanus*) before shifting them in for the night.

Photo by Micaela McPherson

I'm writing this article to implore all keepers (including me) to remove these phrases from our vocabulary.

The most common complaint from keepers is this classic line: "We don't have enough time for training". I'll admit it. I've said it. I used to say this a lot. When I was a new keeper, the manager of my area and the other keeper in the section both left. I had picked up the husbandry routines fast, but being the only keeper in the area meant I was the one who needed to keep things running smoothly with the help of our swing keepers. I wrote nearly all of the records, made sure the monthly cleaning chores got done, and was in constant contact with zoological managers about the state of the run (or string depending on where you work). Because of this pressure, I was unsure if I could handle a new training project but I was eager to prove myself worthy. So, I wrote and submitted training plans for target training, scale training, and crate training Visayan warty pigs, target training and scale training cassowary, as well as, target training, station training, scale training, and wing presentations for our bats. Yep, I went all in. Within six months, all of the behaviors were trained (though bats were trained for wing presentations one-by-one so this took longer). I did it by carving out five minutes every day for training, no matter what. I would do a quick training session





Keeper Sam Kaeser demonstrates weighing Visayan warty pigs (*Suscebifrons*), a task that went from taking 45 minutes to 5 minutes after only a few training sessions. Photo by Ellen Dreyer

after I shifted the bats in. Then, I'd swing by the pig yard on the way to bring in a macaw for a 5 to 10 minute training session - whatever I could manage. Doing short training sessions as often as I could and at the most convenient times (right before feeding or right after cleaning for example) was very effective. Yes, if I had more time I could have trained the behaviors much faster, but I worked within my schedule as a keeper.

I often hear keepers explain that they cannot train their animals because they are waiting for plans to be approved or they can only train when a supervisor is present, and scheduling training time together is challenging. Training plans are certainly important, especially for more complex behaviors, and new keepers should be taught operant conditioning techniques and supervised during their early sessions. This is because we keepers are influencing animal behavior (whether positively or negatively), from the moment we enter their sight to the moment we leave, even if not engaged in a formal training session. When animals don't cooperate, we often reinforce the uncooperative behavior because we have other mouths to feed or stalls that need mucked. For example, when a group of lions stopped shifting to a far room, the keepers would acquiesce and put the food bowl in the middle room where they knew the animals would go for it because the keepers were busy running through their morning check list. However, at the suggestion of the behavioral husbandry manager, the keepers moved the food bowl a few inches closer to the shift door every day, and eventually reestablished the shift behavior.

While working around the animals, we can begin arranging antecedents to set the animals up for success during their next training session. Or, we can focus on husbandry behaviors to make them easier, better, or more stress-free for the animal. For example, when I began training pigs I had to separate them to allow the submissive pig a chance to be reinforced without being charged by the dominant female. This required me to train them each to shift in and out separately when asked. Because shifting was already in the morning routine, I worked on shifting them individually each morning to set me up for success when I began separating them for crate training.

Some keepers may not consider themselves trainers because they have never been formally taught the techniques of operant conditioning, the ABC's of training, or what the bridge signifies. However, there are a

number of ways to educate oneself. For example; ask to observe training sessions; try to read as many of the excellent books on training as you can (Ken Ramirez's *Animal Training: Successful Animal Management Through Positive Reinforcement* is my training bible); attend training workshops and conferences; participate in online webinars such as those from sites like the San Diego Zoo Global Academy. Learning the science of behavior change will help as you apply that knowledge in a training setting to gain experience and hone your skills. Sometimes, showing you are interested is all it takes for a senior keeper to take an interest in you. If you don't want to train animals, you are in a pickle because being a keeper means training. We all influence animal behavior through our actions around them and our interactions with them. If you move too quickly while cleaning a fox enclosure and the fox hides in the bushes when he sees you come into the enclosure, we can predict the fox will continue the behavior of hiding in the bushes, which can make catch-ups more challenging. If you move slowly when near the fox and he begins to come out of the bushes, then you are training the fox just as much as if you were holding a target in your hand and whistle in your mouth (or clicker depending on your preference).

In terms of stress, I think zoo keeping ranks somewhere between emergency room doctor and NASCAR driver. We have all had days where an animal has an exam in the morning, a team member calls out sick, a pipe breaks and floods the aviary, and the truck blows a tire all before noon. This is when I start to tell myself training can wait but husbandry must get done. But, this kind of thinking is a slippery slope. You're stressed out so you rush through your routine and skip training. Then, the next day something else happens and you skip it. Pretty soon, three months have gone by without a single note in the training log (yes, this has happened to me). Training is as much a part of husbandry as feeding, cleaning, and enrichment. A good training program makes the animals' lives better and therefore, our lives better as their keepers. I hope we can rally around our teammates and encourage everyone to reach our training goals (remember, positive reinforcement works on people, too). After all, not every trainer is a keeper but every keeper is a trainer.



While cleaning enclosures, taking quick breaks to work on behaviors seamlessly melds husbandry and training. Keeper Sam Kaeser targets Reeves's muntjac (*Muntiacus reevesi*). Photo by Ellen Dreyer

BHC Comments by Beth Stark-Posta:

What makes a trainer a trainer? Is it years of experience? Someone who's read animal training books? That person who has a way with animals and somehow gets them to modify their behavior? What about the person who hoses an animal to get it to move? All of these qualities can affect one's relationship with and ultimately the behavior of the animals we work with. Animal training involves modifying behavior, whether for better or worse. As the author points out, we all influence the behavior of animals we interact with. So how do we do that? We influence behavior through formal training sessions, in which we plan out training steps and can anticipate the animal's response. In these cases, we often have a game plan – we know what we're looking for and try to find a method that effectively communicates that to the animal. And the animal responds in return, indicating whether it understands what is being asked and whether it is willing to comply. However, there are so many ways we inadvertently influence behavior. A simple act of turning around quickly in response to a sound, or standing up can have a negative impact on an animal - and ultimately on the keeper's relationship with that animal. It is just as easy to have a positive impact on behavior through careful observations of animal behavior and body language and responding accordingly to make sure we put the animal at ease and build a positive relationship built on trust and honest human-animal communication.

Whether formal training or informal interactions, we can have a direct impact on an animal's behavior. For those of you engaging in formal training sessions, keep in mind that you don't need a lot of time to be successful. What you need is a few minutes on a consistent basis. It's easy to carve out one minute for training to obtain a quick response. If this can be done several times per week, you can make steady progress on training goals. The key is consistency and good communication with the animal. There are a lot of excuses of why not to train, many of which are mentioned above... but as seen here, even five minutes per day can have a huge impact. Congratulations to Ms. Dreyer – you're an inspiration to all of us who are time challenged! And keep up the good work. And for the rest of us, let's find our one minute or five minutes and shape our own training successes. Happy training! 🐘

We want to hear your Training Tales – the good, the bad and the fabulous!

Please submit your "Training Tales" and experiences in operant conditioning to share with *Animal Keepers' Forum* readers. This opportunity provides a convenient outlet for you to exhibit your training challenges, methods and milestones with the AAZK member network. Please submit entries based on the following guidelines:

- ▶ Submit a brief description of a training project at your facility. These can be 500 words or less, in text or bullet points – it can be longer (up to 1000 words); however, short and simple descriptions with a few images are just as perfect. Details should include the following:
- ▶ Define the training goal (what did you try to do and for what purpose?)
- ▶ List important steps (How did you do it – include plans that changed along the way/what worked & what didn't work)
- ▶ Timeline used (how long did it take)
- ▶ Tips you learned along the way
- ▶ Include 3-5 digital photos that clearly depict the animal in the learning process or performing the desired goal (provide photo caption and photographer of each image). Photos need to be 300 dpi and at least 1200 x 1800 pixels.

Please send submissions or questions to:

Kim Kezer at kkezer@zoonewengland.com or

Shane Good at shane.good@azk.org

(Use Training Tales Submission as the subject)



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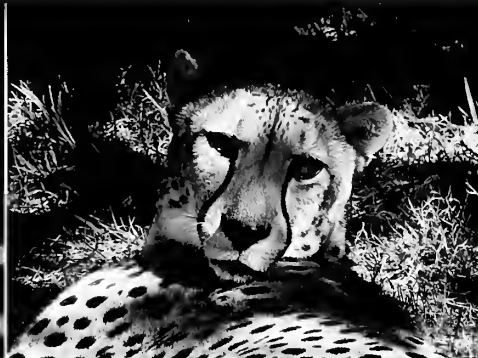


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